

## CLAIMS:

1. A magnetic resonance imaging method wherein
  - magnetic resonance signals are generated, and
  - temporary magnetic gradient fields are applied, and wherein
  - the signal amplitudes of the magnetic resonance signals, or quantities calculated from the
- 5 the signal amplitudes, are corrected for deviations that are due to spatial non-linearities of the temporary magnetic gradient fields.
- 10 2. A magnetic resonance imaging method as claimed in claim 1, wherein the correction of the signal amplitudes of the magnetic resonance signals is calculated from the spatial and temporary electrical current distribution through the gradient coil.
- 15 3. A magnetic resonance imaging method as claimed in claim 1, wherein diffusion-weighted magnetic resonance signals are generated.
- 20 4. A magnetic resonance imaging method as claimed in claim 3, wherein the sequence of temporary gradient fields includes a bipolar gradient pair.
5. A magnetic resonance imaging method as claimed in claim 3, wherein the sequence of temporary gradient fields includes a pair of gradient pulses that are separated by
- 25 an RF refocusing pulse.
6. A magnetic resonance imaging method as claimed in claim 3, wherein the diffusion sensitivity (B) is corrected for deviations that are due to spatial non-linearities of the temporary magnetic gradient fields.
- 25 7. A magnetic resonance imaging method as claimed in claim 1, wherein
  - the sequence of temporary gradient fields provides flow sensitivity, and
  - a flow quantity is derived from the magnetic resonance signals, and



- the flow quantity is corrected for deviations that are due to spatial non-linearities of the temporary magnetic gradient fields.

8. A magnetic resonance imaging system which is arranged

- 5
- to generate magnetic resonance signals, and
  - to apply temporary magnetic gradient fields, and
  - to correct the signal amplitudes of the magnetic resonance signals, or quantities calculated from the signal amplitudes, for deviations that are due to spatial non-linearities of the temporary magnetic gradient fields.

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9. A computer program with instructions for

- 15
- generating magnetic resonance signals, and
  - applying temporary magnetic gradient fields, and
  - correcting the signal amplitudes of the magnetic resonance signals, or quantities calculated from the signal amplitudes, for deviations that are due to spatial non-linearities of the temporary magnetic gradient fields.